

CLAIMS

1. A water treatment system for treating a waste stream, the water treatment system comprising:

a pH control system that detects a pH level of the waste stream;

an acid discharge unit communicating with the pH control system, the acid discharge unit including a source of acid and an acid feeding mechanism, wherein the pH control system activates and deactivates the acid discharge unit according to the pH level of the waste stream; and

a housing containing the acid discharge unit and at least part of the pH control system.

2. A water treatment system according to claim 1, wherein the pH control system comprises a pH probe disposed in the waste stream, outside of the housing.

3. A water treatment system according to claim 1, wherein the source of acid comprises an acid storage unit storing a supply of dry acid.

4. A water treatment system according to claim 3, wherein the acid feeding mechanism is at least partially disposed within the acid storage unit, the acid feeding mechanism feeding the dry acid into the waste stream when the pH level of the waste stream exceeds a predetermined level.

5. A water treatment system according to claim 3, wherein the acid feeding mechanism comprises a mechanical pump coupled with a source of water and a mixing container for mixing the dry acid with the water to form a wet acidic solution, the acid feeding mechanism feeding the wet acidic solution into the waste stream when the pH level of the waste stream exceeds a predetermined level.

6. A water treatment system according to claim 5, wherein the source of water is the waste stream.

7. A water treatment system according to claim 5, wherein the mixing container comprises an overflow outlet that pipes the wet acidic solution directly into the waste stream.

8. A water treatment system according to claim 3, wherein the dry acid comprises a granular material that dissolves in water to form a weak acid solution.

9. A water treatment system according to claim 8, wherein the dry acid comprises sodium bisulfate.

10. A water treatment system according to claim 1, further comprising a mixing tank downstream of the housing, the mixing tank providing an area for acidic materials from the acid discharge unit to mix with the waste stream to become an aqueous solution with an acceptable pH level for discharge from the water treatment system.

11. A water treatment system according to claim 10, wherein the pH control system comprises a pH probe disposed in the waste stream downstream from the mixing tank.

12. A water treatment system according to claim 10, wherein the mixing tank is sized to store a liquid volume equal to about ten minutes of waste stream flow.

13. A method of treating a waste stream, comprising:

(a) detecting a pH level of the waste stream;

(b) storing a dry acid in an acid source and coupling the acid source with an acid discharge unit;

(c) activating and deactivating the acid discharge unit according to the pH level of the waste stream; and

(d) containing the acid discharge unit and at least part of the pH control system within a housing.

14. A method according to claim 13, wherein the acid discharge unit comprises an acid feeding mechanism at least partially disposed within the acid source, and wherein step (c) comprises feeding the dry acid into the waste stream when the pH level of the waste stream exceeds a predetermined level.

15. A method according to claim 13, wherein the acid discharge unit comprises an acid feeding mechanism including a mechanical pump, and wherein step (c) comprises:

coupling the mechanical pump with a source of water;
flowing the water to a mixing container for mixing the dry acid with the water to form a wet acidic solution; and
feeding the wet acidic solution into the waste stream when the pH level of the waste stream exceeds a predetermined level.

16. A method according to claim 15, wherein the source of water is the waste stream.

17. A method according to claim 15, wherein the mixing container comprises an overflow outlet, and wherein step (c) is further practiced by piping the wet acidic solution directly into the waste stream via the overflow outlet.

18. A method according to claim 13, wherein the dry acid comprises a granular material that dissolves in water to form a weak acid solution.

19. A method according to claim 18, wherein the dry acid comprises sodium bisulfate.

20. A method according to claim 13, further comprising providing an area for acidic materials from the acid discharge unit to mix with the waste stream to become an aqueous solution with an acceptable pH level for discharge into the waste stream.

21. A pH level reduction system for concrete plant discharge, the system comprising:

means for detecting a pH level of the plant discharge;

an acid discharge unit communicating with the pH control system, the acid discharge unit including a source of acid and an acid feeding mechanism, wherein the detecting means comprises means for activating and deactivating the acid discharge unit according to the pH level of the plant discharge; and

a housing containing the acid discharge unit and at least part of the pH control system.

22. A pH level reduction system for a waste stream, the system comprising:

a pH control system including a pH probe disposed in the waste stream that detects a pH level of the waste stream;

an acid discharge unit communicating with the pH control system, the acid discharge unit including a source of dry granular acid and one of a wet acid feeding mechanism and a dry acid feeding mechanism, wherein the pH control system further includes a controller communicating with the pH probe that activates and deactivates the acid discharge unit according to the pH level of the waste stream in a feedback control loop; and

a weatherproof housing containing the acid discharge unit and the controller of the pH control system.

23. A system according to claim 22, wherein the dry granular acid comprises sodium bisulfate.